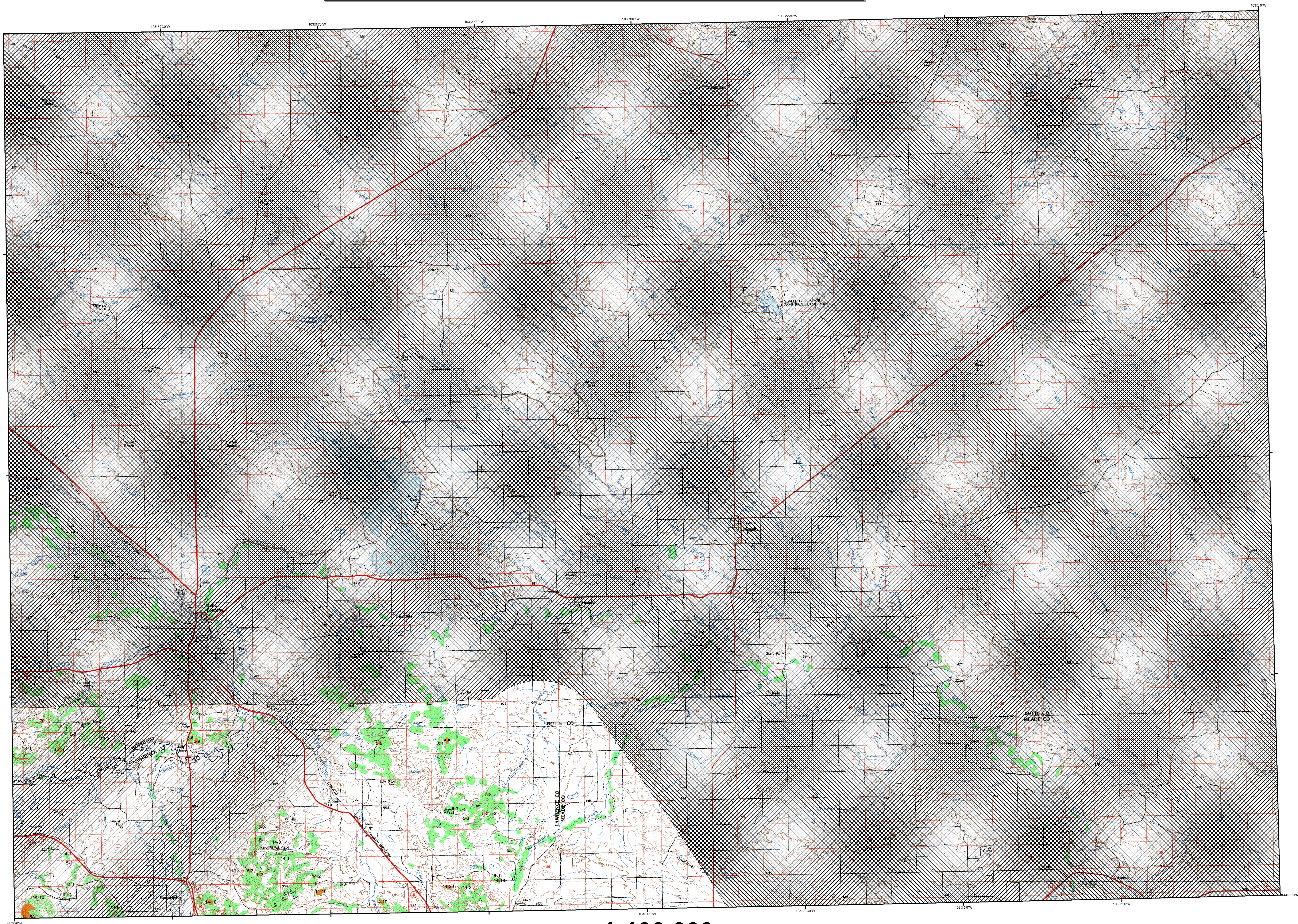



# 2004 Aerial Insect and Disease Survey Belle Fourche, South Dakota USGS 100K DRG: 44103-E1



1:100,000

## Legend

 Causal Agent(s)  
Code, Causal Agent,

5, Mountain pine beetle,  
14, Pine engraver,  
70, fire,  
112, spruce lps,

 Not Flown in 2004  
Primary Host(s)

Ponderosa pine  
Ponderosa pine  
all tree species  
white spruce

### Use of the Number System



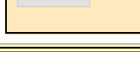
Example: S-25 - The first number before the dash is the causal agent code. The number after the dash is the number of dead "fader" trees in the polygon or point. When recent dead trees are not counted, an intensity code of 1-100 may be used after the causal agent code. Periodically, trees per acre estimates are used after the causal agent code instead of number of dead "fader" trees (or an intensity code). For example: S-1/2A - The first number before the dash is the causal agent code. The number after the dash is an estimation of the number of dead "fader" trees in the polygon per acre. In this case it would be an estimation that, on the average, one tree per every two acres would be a dead "fader" tree. In another example: S-3A = that on the average, an estimated three trees per acre are dead "fader" trees. A 0/25 is used as a separator when a point/polygon has more than one causal agent code.

Area surveyed by Erik Johnson and Bill Schaupp 7/19 - 7/22 2004.  
Projection: UTM NAD27 Zone 13  
Author: Hui Wang, USDA Forest Service  
Date Created: 8-5-04.

## USGS 100K Quad - Location Map



### Legend

 Flown Area in 2004  
 State Boundaries  
 Counties

## How Aerial Surveys Are Conducted

Data represented on this map are based on aerial observations manually recorded onto a map. This procedure is considered both an art form and a form of scientific data collection, and is highly subjective. An observer only has a few seconds to recognize the color difference between healthy and damaged trees of different species; diagnose causal agents correctly; estimate intensity; delineate the extent of damage; and precisely record this information on a georeferenced map. Air turbulence, cloud shadows, distance from aircraft, haze, smoke, and observer experience can all affect the quality of the survey. These data summaries provide an estimate of conditions on the ground and may differ from estimates derived by other methods.

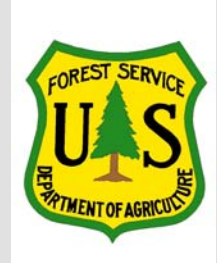
Aerial surveys provide information on the current status for many causal agents, and are important when examining insect activity trends by comparing historical and current survey data over large areas.

Overview surveys are a "snap shot" in time and therefore may not be timed to accurately capture the true extent or severity of a particular disturbance activity. Aerial surveys can be thought of as the first stage in a multi-stage sampling design. Other remote sensing approaches, including aerial photography, electro-optical sensors, and specially designed aerial surveys with modified flight patterns, can be used to more accurately delineate the extent and severity of a particular disturbance agent. The preceding methods are often more costly than overview surveys, and are generally reserved to address situations of sufficient environmental, economic, or political importance.

A data dictionary and digital copies of this map and the insect and disease data are available at:  
<http://www.fs.fed.us/r2/resources/fhm/aerialsurvey/>

## DIRECT ALL INQUIRIES TO:

Resource Conservation and Forestry Division  
3305 1/2 West South Street  
Rapid City, SD 57702 - 8160



USDA Forest Service, Region 2  
Renewable Resources  
Forest Health Management  
PO Box 25127  
Lakewood, Colorado 80225

### \*\*\*\*\*DISCLAIMER\*\*\*\*\*

Due to the nature of aerial surveys, the data on this map will only provide rough estimates of location, intensity and the resulting trend information for agents detectable from the air. Many of the most destructive diseases are not represented on this map because these agents are not detectable from aerial surveys. The data presented on this map should only be used as a partial indicator of insect and disease activity, and should be validated on the ground for actual location and causal agent. Shaded areas show locations where tree mortality or defoliation were apparent from the air. Intensity of damage is variable and not all trees in shaded areas are dead or defoliated.

The insect and disease data represented on this map are available digitally from the USDA Forest Service, Region Two Forest Health Management group. The cooperators reserve the right to correct, update, modify or replace GIS products. Using this map for purposes other than those for which it was intended may yield inaccurate or misleading results.

